CLAIMS

1. Mold for the continuous casting of molten metals, especially steel, with cooling channels (1), such as cooling grooves, cooling slits, or cooling bores, in the side (2) of the mold that faces away from the melt contact surface, characterized in that the geometric designs of the heat-transfer surface areas of a cooling channel (1) or of a group of cooling channels are adapted in shape, cross-sectional area, circumference, boundary surface properties, orientation relative to the contact surface, arrangement and/or density of arrangement relative to the contact surface to the local development of the heat flux density and/or temperature of the contact surface (18) in the casting operation and especially in the meniscus region (11).

2. Mold according to Claim 1, characterized in that, to influence the local cooling effect of a cooling channel (1), the channel's shape, cross-sectional area, circumference, boundary surface properties, orientation, and arrangement and density of arrangement relative to the contact surface are locally varied.

3. Mold according to Claim 1 or Claim 2, characterized in that the geometric designs are used individually or in combination in at least one cooling channel (1) or group of cooling channels.

4. Mold according to one or more of Claims 1 to 3, characterized in that the geometric designs of a cooling channel (1) or group of channels merge with each other smoothly or discontinuously.

5. Mold according to one or more of Claims 1 to 4, characterized in that, in conformity with the design of the cooling channels (1), the cooling effect of the cooling channels (1) is maximized in the region of the maximum heat flux density or the maximum temperature of the contact surface (18).

6. Mold according to one or more of Claims 1 to 5, characterized in that, to influence the local cooling intensity of a cooling channel (1), its effective heat-exchange surfaces on the base of the channel or on the lateral surfaces are adjusted by increasing or decreasing them.

7. Mold according to one or more of Claims 1 to 6, characterized in that grooves or scores additionally introduced to increase the heat-exchange surfaces in the cooling channels

are cross-sectionally shaped as rectangles, triangles, trapezoids, circular or elliptical segments, or any desired free forms and are adapted to the course of the cooling channels in their number, depth, and width, and in their relative positioning parallel to one another or in some other desired arrangement.

8. Mold according to one or more of Claims 1 to 7, characterized in that the heat-transfer surfaces of the cooling channels (1) are altered with respect to their boundary surface properties to influence the local cooling intensity, e.g., by producing well-defined surface roughness for increased heat transfer or by applying additional layers for reduced heat transfer.

9. Mold according to one or more of Claims 1 to 8, characterized in that, to influence the local cooling intensity of a cooling channel (1), its isoperimetric cross-sectional area is increased by providing additional grooves in the base or lateral surfaces or decreased by inserting displacement bodies.

10. Mold according to one or more of Claims 1 to 9, characterized in that, to influence the local cooling intensity of a cooling channel (1) and to alter the coolant flow, which is

initially aligned straight relative to the contact surface, additional grooves are produced in the base and/or lateral surfaces of the cooling channel, or additional displacement bodies are inserted, and/or an altered wall shape of the cooling channels (1) is provided.

11. Mold according to one or more of Claims 1 to 10, characterized in that, to influence the local cooling intensity, the cooling channels (1) are arranged locally or overall with respect to their distance from the contact surface and/or the density of their arrangement, i.e., the number of cooling channels per unit length of the mold width.

Figures 6 and 7:

KEY:

Bad = bath (molten metal level)

Figure 8:

KEY:

Kühlmittel = coolant

Kokille = mold

Gießhilfsmittel = casting aid

Meniskus = meniscus

Metallschmelze = molten metal

Wärmestrom = heat flux

Gießrichtung = casting direction

Figure 9:

KEY:

lokale Wärmestromdichte/Temperatur = local heat flux density/temperature

Meniskus = meniscus

Q_{max} bzw. T_{max} = Q_{max} or T_{max}

Gießrichtung = casting direction

mittlere bzw. globale Wärmestromdichte bzw. Temperatur = mean or overall heat flux density or temperature

lokale wärmeübertragende Kühlkanalfläche = local heat-transfer cooling channel surface

variabel über Anzahl, Form, Tiefe von Kühlkanalnuten = variable by the number, shape, and depth of cooling channel grooves

Figure 12:

KEY:

Kokillenfuß = mold base

Meniskusbereich = meniscus region

Kokillenkopf = mold head

Kontaktfläche zum Stahl = contact surface with steel

Kanalquerschnittsfläche = channel cross-sectional area

Wirks. Kühlkanalwandfläche = effective cooling channel wall area

Abstand zur Kontaktfläche = distance to the contact surface

Kühlwirkung = cooling effect

Werte sind Relativewerte und nur exemplarisch = values are relative values and are given only as examples